

NGMS User Guide. August 2008

In this tutorial the basic principles of the NGMS user interface are explained. You will be guided through all relevant displays in NGMS.

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1 Introduction to the guide

This document forms the user guide for the National Groundwater Management System (NGMS) for England and Wales. It provides a guide on how to operate the system. Information relating specifically to the regional groundwater models including geological maps, model schematisations and details of model runs can be found in the on the NGMS documentation website at e.g. <http://aphrodite.testux.ntnl/index.html>.

2 How to launch the application (Login Dialog)

2.1 Log in

NGMS is developed with four types of users in mind.

The User profile 'Viewer' is assigned to staff members who need information on the hydrogeology and associated groundwater models as available on the NGMS documentation website.

The User profile 'Hydrogeologist' is intended for staff members that would like to have access to model outputs. This may include the ability to define what if-scenarios and dispatch new runs. Hydrogeologist will primarily interact with the so-called 'Operator Client', i.e. the main graphical user interface of the NGMS.

The User profile 'Custodian' is assigned to those staff members which are responsible for model management, i.e. keep the model up to date, including the management of associated data sets and configurations. To conduct this task, a dedicated Configuration Management tool is accessible for them.

The User profile 'System Manager' is meant for head Office and CIS staff, as they are responsible for maintenance of the system. The web-based Admin Interface offers the tools to manage the central system of NGMS.

To log in:

- Double click on the NGMS icon to start the Application Launcher.
- Choose the relevant user profile.
- As user "Hydrogeologist" or "Viewer" you do not need to enter a password. For the passwords for the "Custodian" or "SystemManager" please see relevant documentation.
- To open the application launcher click "OK"



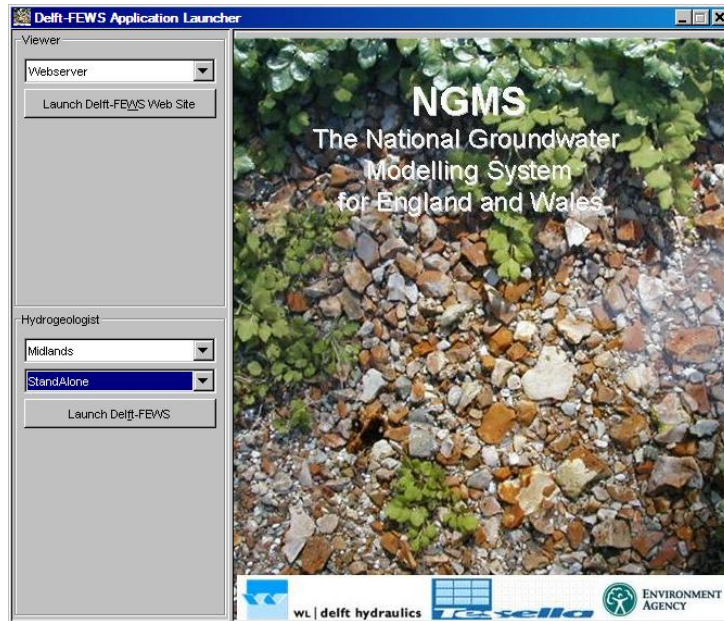
2.2 Application selection

In the Application Launcher you can choose between the different regions and application types. Each region holds one or more groundwater models. When a

groundwater model is shared by two regions, only one of them will contain this model in NGMS. See the documentation website for details.

To start the application of interest for the region of interest:

- Select the region of interest, for example 'Midlands'.
- Select application type 'Online'. This allows the user to start the main user interface and connect to the centrally hosted database. Choosing the "StandAlone" option allows the user to inspect a database which has been previously synchronised with the central system.
- Click "Launch Delft-FEWS"



2.3 Logging into the central system

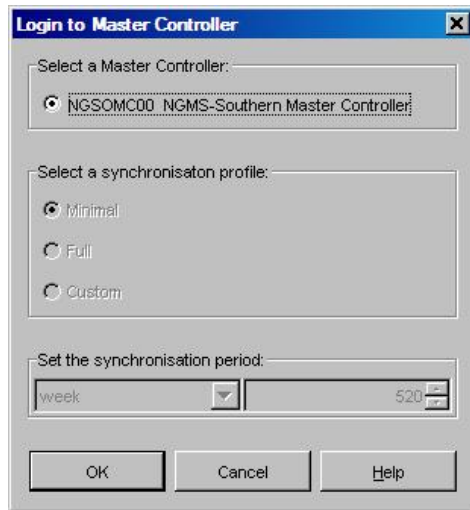
Your local system contains a database which holds all of the information which you view through the Explorer. Connecting to the central system gives you the option to synchronise (i.e. download) the latest model results available in the system since your last login. It also gives you the opportunity to execute model runs on an external machine (a forecasting shell machine).

2.3.1 First time login

If this is your first login to the system, the system only has information to connect to the central server. It will need to connect to this server to download the remainder of the system setup, i.e. the configuration. Therefore you will see this message:



You will then be prompted to choose a connection to the Master Controller (i.e. the control unit at the central server).



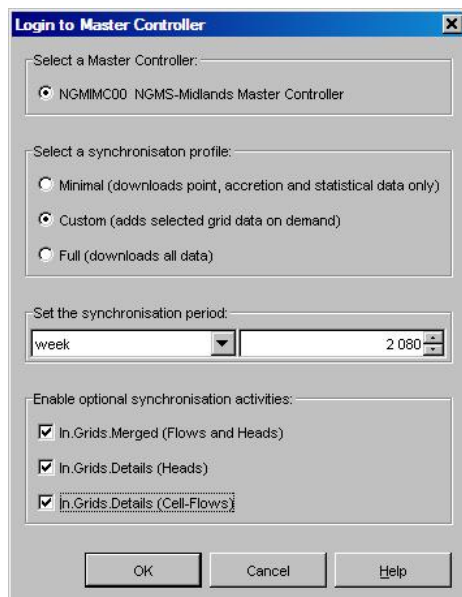
Click “OK” to continue and download the latest configuration to your desktop. This download will typically take a minute or two. Once the system has downloaded the latest system setup files (known as “configuration files”), it automatically disconnects from the server. The main user interface will show screen as shown in section 4. To view any data, you will need to log on again, in order to download the data to your local database (see next section).

2.3.2 Login to download/synchronise data

To login for data downloads:

- Select menu File → login

The system will present the following login screen:



This time you will be presented with some login options. You can choose “Minimal”, “Full” or “Custom”. These different options allow different amounts of data to be

synchronised from the central system to your local system. Once the system has downloaded the data locally, one can view model results even while the Operator Client is disconnected from the server.

With both minimal and full profiles the actual data is transferred and synchronised to your local database. All model results are therefore immediately available for viewing.

By choosing a “Custom” profile some of the larger grid datasets are only transferred to your local system “on-the-fly” meaning that when you select a dataset to view (in the time series display or spatial display), it is transferred at that moment. Once it is downloaded, it checks for any new data whenever you access that view.

This option saves downloading large data sets at once (e.g. at the time of login) but can lead to a short delay¹ when viewing grid datasets. The “Custom” period also allows the user to choose between types of data, as well as the time series length (synchronization period) being synchronized. **The recommended login profile for most users is “Custom” with the optional synchronisation activities selected.**

¹ Tens of seconds for larger models

The table below gives information about the type of data associated with each synchronisation option:

Profile:	Minimal	Custom (Merged Grids)	Custom (Head Details)	Custom (Flow details)	Full
Data types:		on-the-fly	on-the-fly	on-the-fly	
Point locations	×	×	×	×	×
▪ Observation boreholes					
▪ Gauging stations					
▪ Abstraction wells					
▪ SW laterals					
GW units	×	×	×	×	×
Accretion Profiles	×	×	×	×	×
Statistics	×	×	×	×	×
Recharge		×			×
Surface water flows		×			×
Upper GW table		×			×
Total cell flows		×			×
Heads for individual layers			×		×
Cell flows for individual layers				×	×

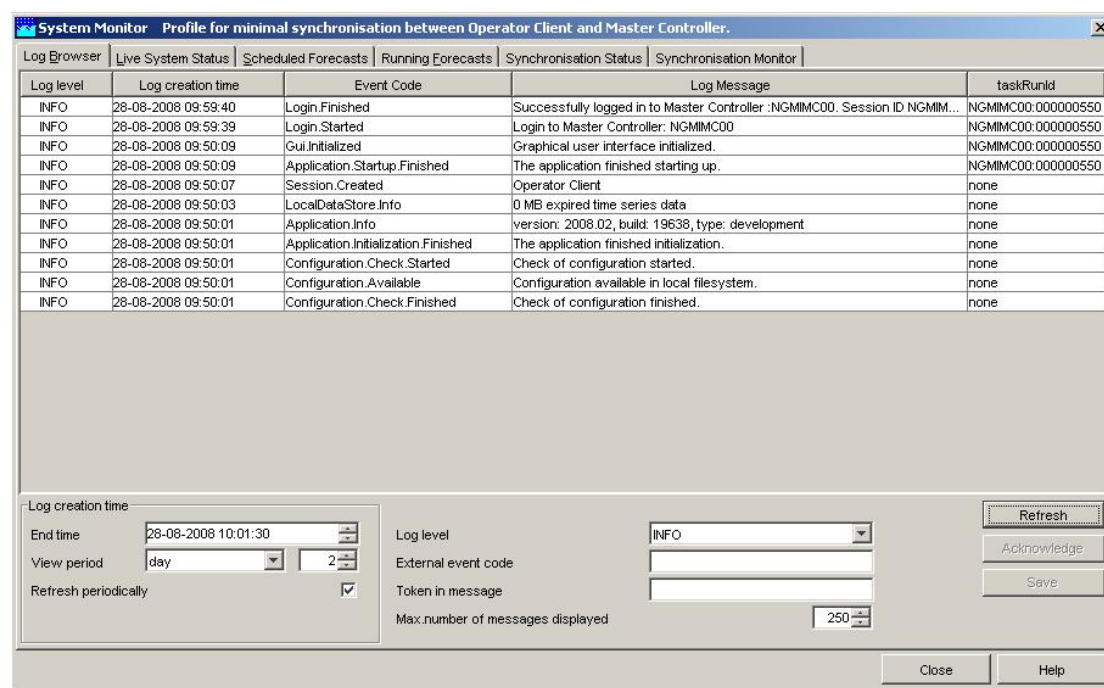
Once you have chosen your synchronisation option, the system will check every 60 seconds if new data or messages are available at the central database. This means that when you make changes to data or create new runs, others will also notice your runs and may download these from the central database as well.

3 System monitor

Once you are logged into the system, the system monitor allows you to monitor the status of the system. You can open the system monitor by clicking the “System Monitor” button in the task bar.

3.1 Log Browser

The log browser allows the user to monitor the messages produced by the system. These are the same messages seen in the lower panel of the explorer. You can use the filters at the bottom of the screen to find specific messages. Most important are the Warn, Error and Fatal messages, which could indicate a problem with the system.



3.2 Live system status, scheduled and running forecasts

These three tabs show information about the live system and allow the originator of the run to cancel, suspend, resume or pause a task on the live system. Once a task is running the originator also has the option to kill the task.

3.3 Synchronisation status and monitor

The synchronisation status tab allows the user to monitor the communication between the central database and your local application. Most relevant for downloads of NGMS data are:

- Activity.In.ForecastData:
this activity synchronises data typically associated with the minimal profile
- In.Grids.Merged:
this activity downloads the grids for merged model layers (e.g. top active layer for heads, total flow fields etc.)
- In.Grids.Details (Heads)
this activity downloads all grid time series with head information (including head differences) for each individual model layer

- In.Grids.Details (Cell-flows)
This activity downloads all grid time series with cell flow information (horizontal and upward) for each individual model layer.
- Activity.In.BlobDownload:
This activity will download model results ‘on-the-fly’ when the associated data set is selected in the viewer

Other synchronisation activities listed are primarily meant for system maintenance and messaging.

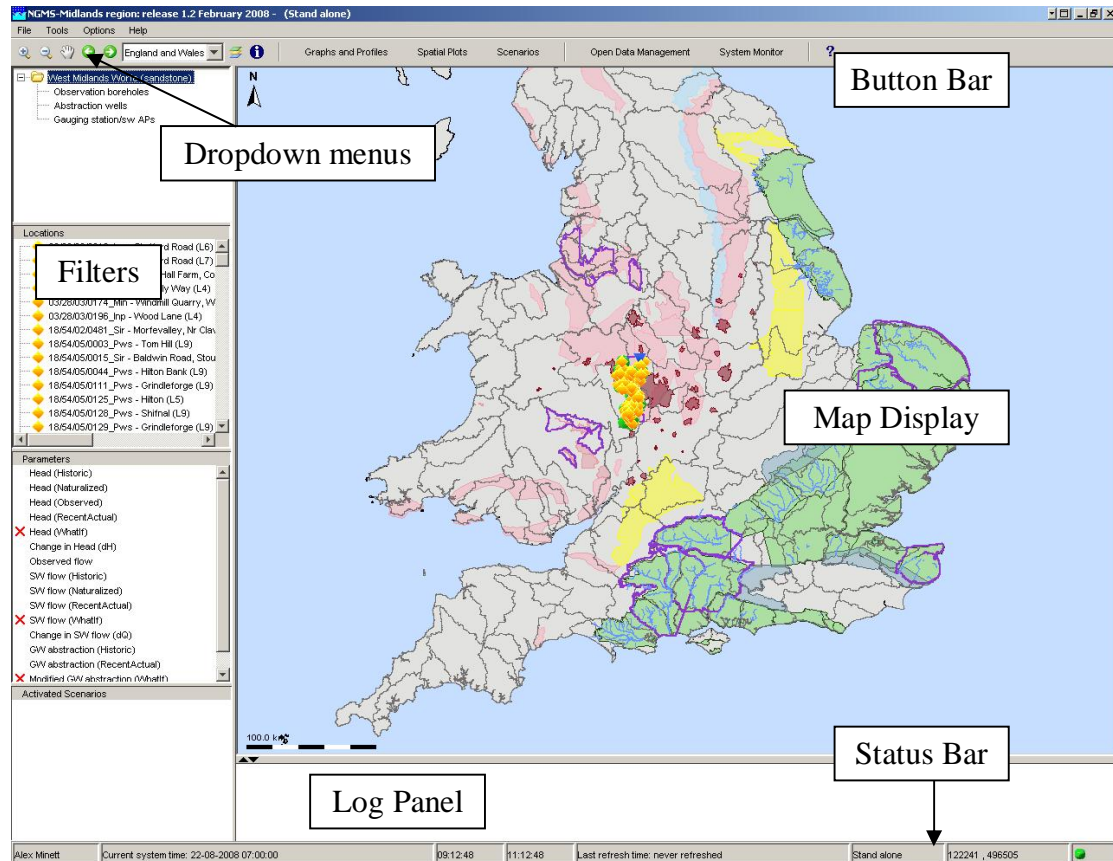
The screenshot shows a window titled "System Monitor Profile for minimal synchronisation between Operator Client and Master Controller." The window contains a table with the following data:

Activity ID	Type	Frequency	LastSynchTime	Status	Progress
Activity.In.Configuration	continuous	21600	28.08.2008 09:59:41		
Activity.In.RecordsPendingD...	continuous	3600	28.08.2008 09:59:45		
Activity.In.FewSessions	single	0	28.08.2008 09:59:38		
Activity.In.ForecastData	single	0	25.08.2008 09:14:50		
Activity.In.Forecasts	single	0	28.08.2008 10:12:11		
In.Grids.Merged (Flows and ...)	single	0			
In.Grids.Details (Heads)	single	0			
In.Grids.Details (Cell-Flows)	single	0			
Activity.In.ImportData	single	0			
Activity.In.ManualData	single	0			
Activity.In.LiveSystemStatus	continuous	30	28.08.2008 10:12:11		
Activity.In.LogEntries	continuous	60	28.08.2008 10:11:41		
Activity.In.Tasks	continuous	30	28.08.2008 10:12:11		
Activity.In.ThresholdEvents	single	0			
Activity.In.ImportStatus	single	0			
Activity.Out.CurrentForecast	single	0	28.08.2008 09:59:47		
Activity.Out.LogEntries	single	0			
Activity.Out.WhatifScenarios	single	0			
Activity.Out.Tasks	single	0			
Activity.Out.TimeSeries	single	0	28.08.2008 09:59:47		
Activity.Out.RecordsPendin...	single	0			

The window also features a "Close" button and a "Help" button at the bottom right.

4 FEWS explorer (Map Dialog)

After starting the application, the Fews explorer screen appears. This window is the basis from which other displays are activated.



4.1 How to navigate on the map

- Zooming can be done directly by pointing the mouse at map and scrolling the wheel. The map zooms centrally around the mouse pointer. To see more of the left side of the map, point the mouse at the right side of the map and scroll.
- Panning can be done by dragging the mouse while the right mouse button is pressed.
- An alternative is to use the click zoom/pan buttons in the upper left corner. Draw a box to select your area of interest. The left and right arrows take you to your previous zoom extents.



4.2 GIS map facilities

- You can choose the layers which you can see by selecting the Layers icon in the menu bar



- You can then choose the layers which are shown in your explorer display. Note that some map layers only appear at certain zoom levels.



5 How to open/activate a data set (Forecast Manager)

5.1 Via Explorer

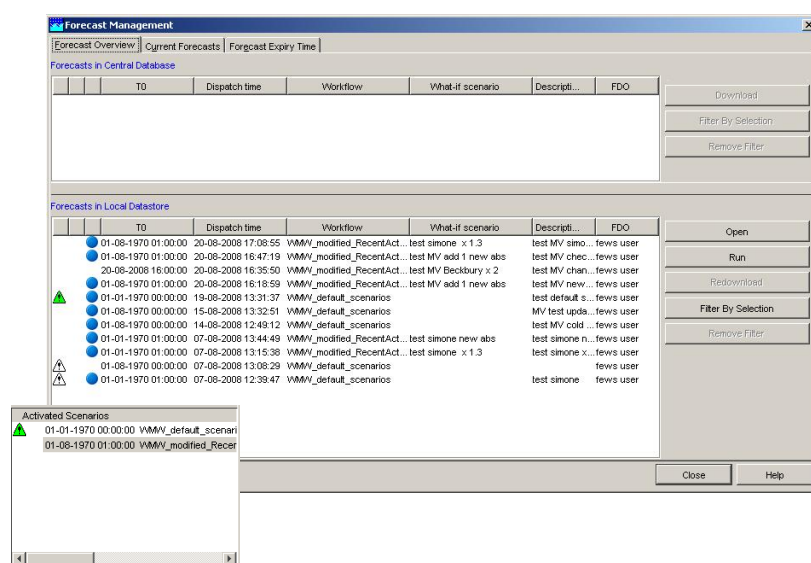
The Open Data Management display, can be opened in the Explorer through “File” in the dropdown menus and choose “Open Data Management” or simply click on the Open Data Management button in the tool bar.

5.2 The Data Management dialog

5.2.1 Opening the data set

The default scenario runs (i.e. Calibrated Historic, Naturalized, Recent Actual, Fully Licensed) are typically approved, or in FEWS terms ‘current forecasts’. Approving a forecast means that all users will receive the information from this run when they log into the central system and the information from this run is automatically available in the displays. Approved forecasts are identified in the open data management display with a green triangle. These forecasts do not therefore need to be opened. However to compare default scenarios with other runs, you can open these test runs via the data management dialog:

- Select from the ‘Forecast in Local Datasore’ panel the ‘XXX_default_scenario’ workflow.
- Click on the <Open> button.
- Close the Forecast Manager.
- In the lower-left corner of the principal window screen the selected run appears in the ‘activated scenarios’ square. You can open one or more runs for comparison purposes.
- In order to find your required runs more easily you can click on the column header to sort alphabetically or select (a portion) of a cell and click “Filter by Selection”. The table will then show only runs where your search item matches.



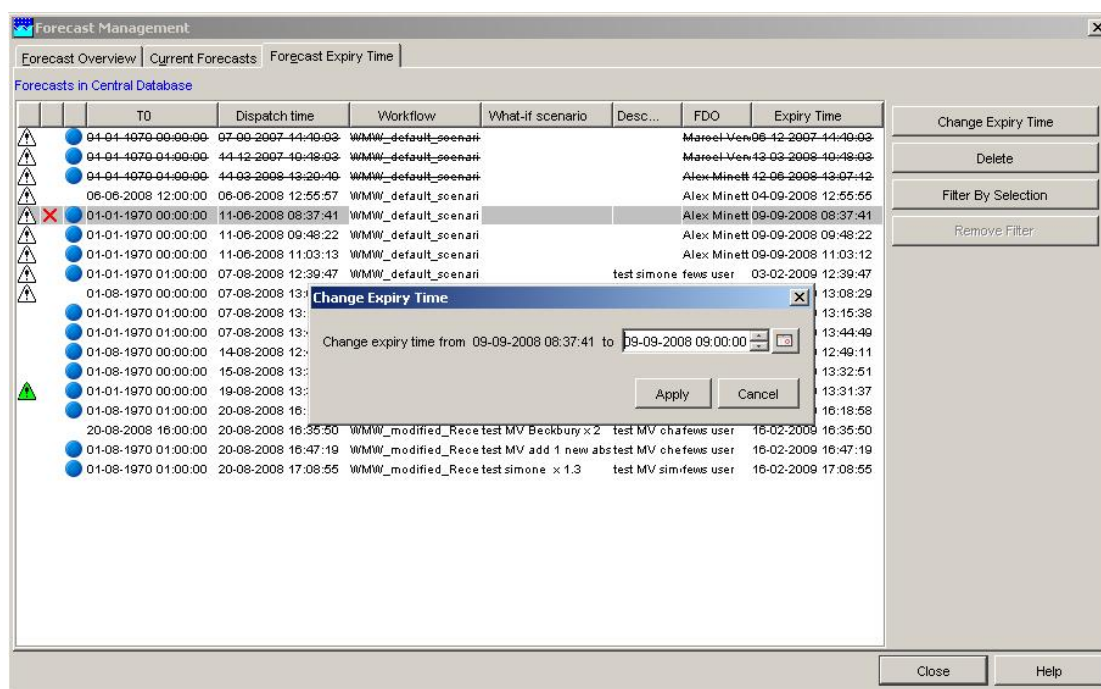
5.2.2 Downloading a data set from the central system

Approved runs are automatically downloaded from the central database when logged in to the system. Unapproved runs have to be downloaded manually using the forecast manager.

In the forecast overview tab, simply select a run from the “Forecasts in Central Database” window and click “Download” to synchronise the data for this run. Note that the amount of data downloaded is controlled by your login settings (e.g. minimal, full or custom). The “Redownload” button allows you to retrieve more data for a run already in your local datastore from the central database. This can be useful if you were previously logged in as “minimal” and are now logged in with a “full” login profile. Redownloading can also be useful if there was a problem during the downloading of a model run (due to connection problems for example). Please note that redownload basically overwrites data already available locally.

5.2.3 Changing the expiry time of your run (incl.deletion)

Within NGMS, all data is held in the database for a limited period of time after which a ‘rolling barrel’ kicks out the data. The default expiry time for a run is 6 months. This means that after 6 months your run will be deleted from the central database. If you would like to keep your run for longer you can extend the expiry time in the forecast manager. Select the “Forecast Expiry Time” tab, select the forecast you wish to change and click the “Change Expiry Time” button.



For test and incomplete runs you can also decide to shorten the expiry time or to delete the run completely. This increases the storage space available on the system. Data is deleted locally by the rolling barrel event, i.e. while closing the operator client.

Please note that this functionality is regarded as a responsibility for custodians and may therefore not be available to all users. Please see your local NGMS custodian for more details.

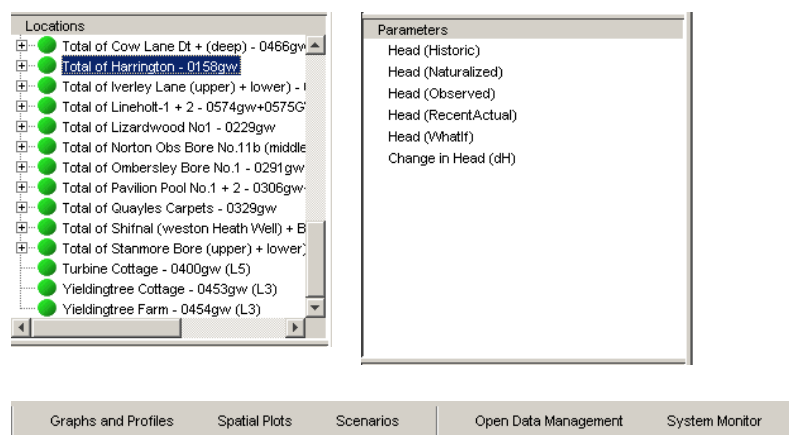
6 How to work with graphs (Data Display and Data Editor)

6.1 Selecting/opening a graph via Filters in the Explorer


The filters in the left panel in the Explorer window screen allow the user to view information for specific location and parameter combinations. To make a selection via the Filters:

- Double click the folder of an area and select a location type
- Select a Location (this can also be done by selecting a location on the map)
Individual observations or abstractions within a multi-layer boreholes) are accessible by clicking the '+’.
- Select a Parameter
- Then select <Graphs and Profiles> in the button bar

By holding the <Shift> or <Ctrl> button you can select multiple locations or parameters. Please note that selection of a ‘parent location’ will also show the time series graphs of its ‘childs’



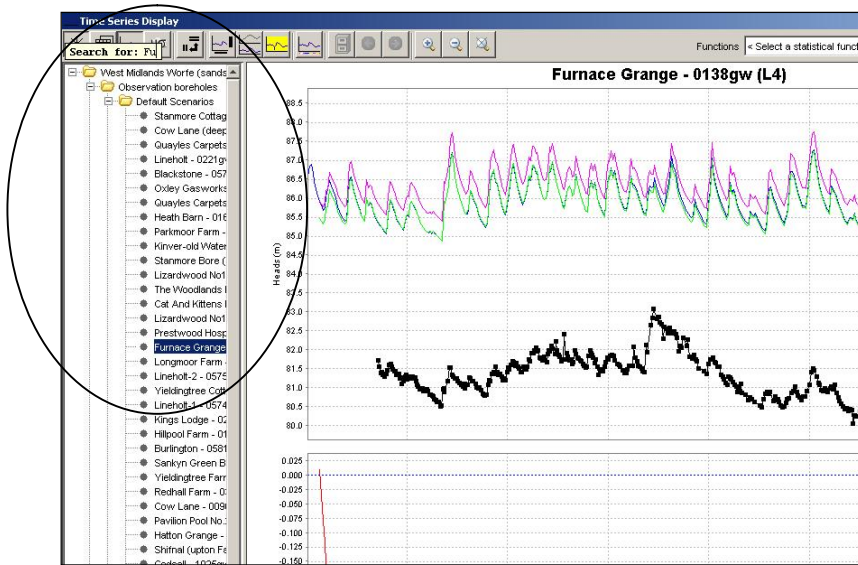
6.2 Selecting a graph via shortcuts in display

- Select <Graphs and Profiles> in the button bar
- Click the shortcut button  to show the predefined display options.
- Open the folders and select the appropriate location for display.
Note that the graphical layout of these graphs, including its data set combination, is predefined

6.3 Searching specific locations

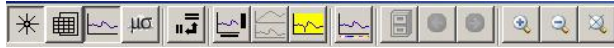
Both the Explorer filters as well as the Display shortcuts offer a search facility:

- Activate the panel where you would like to search (e.g. the left panel in the Time series dialog)
- Type your search string. The cursor will move to the line starting with your string
- To search anywhere in the list (i.e. not at the start of a line), use a wild card ‘*’ and type your string.



6.4 Managing layouts

The Time Series Display offers various layout options



6.4.1 How to obtain a table

Click on the second icon <Table>. By clicking this button the time series in the graph is also displayed in tabular format.



Table

When a column is selected, the right mouse button offers a range of copy-paste facilities.

6.4.2 How to rotate the table and graph position

Click on the <Rotate splitter> button. With this button the splitter between table and graph can be placed in a horizontal position.



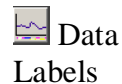
Rotate
Splitter

Clicking the same button again returns the splitter to its default vertical position. Make sure that the table is given in vertical position

There are also options to split the graphs, and to toggle the axis labels on and off.

6.4.3 Data labels

Data labels are not currently used in NGMS.



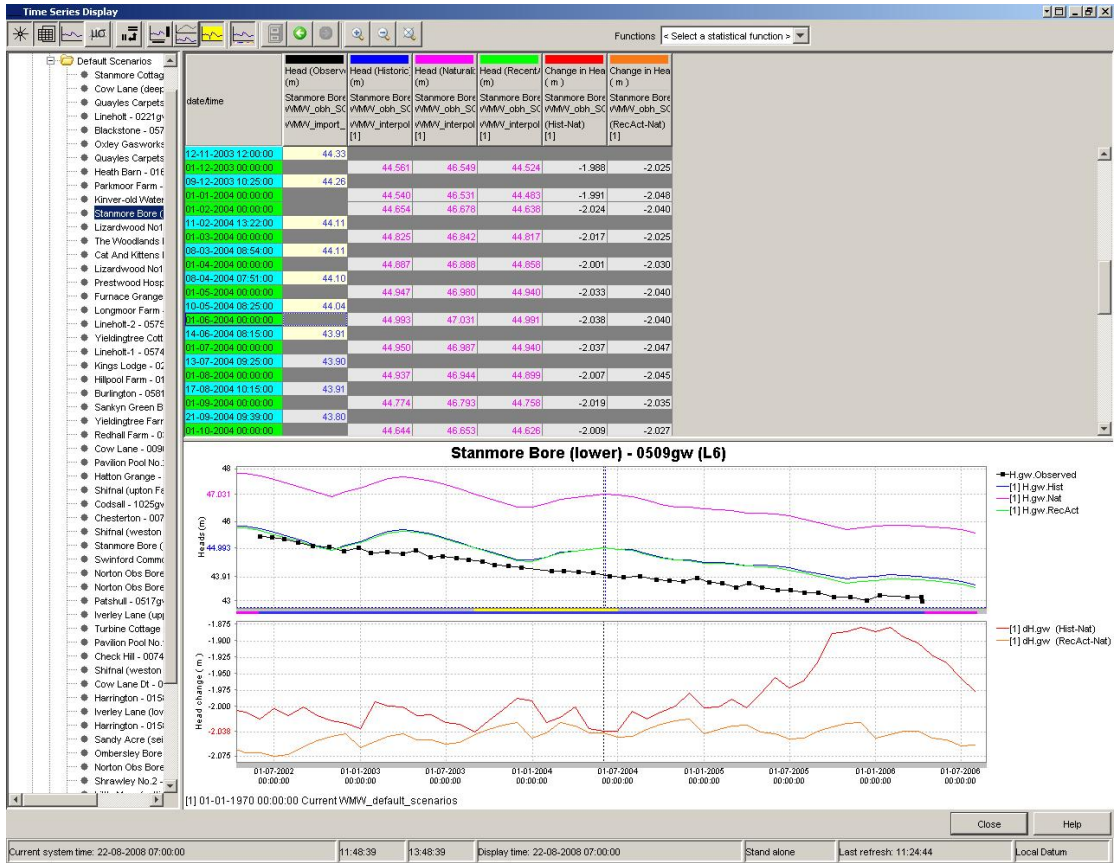
Data
Labels

6.4.4 Shortcuts

The shortcuts button allows the user to view predefined data displays. The folders are arranged in logical groups which can be navigated using the + and – boxes next to the folders.



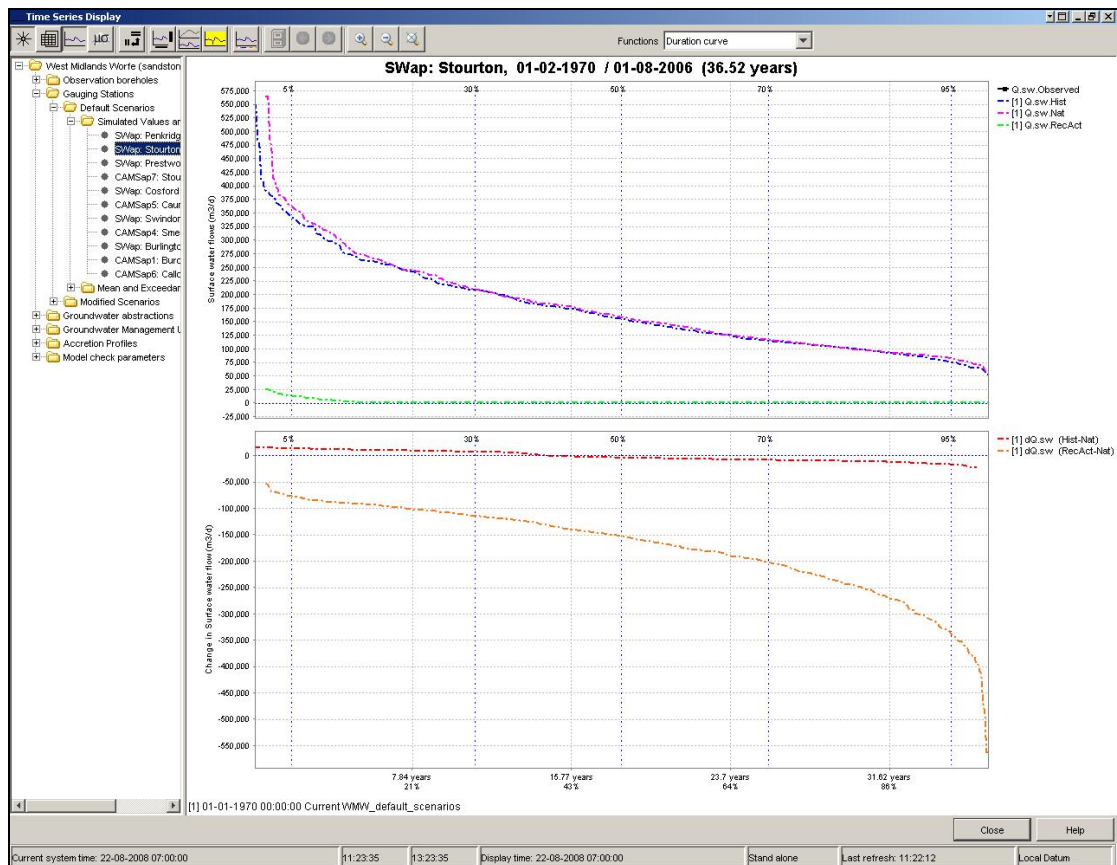
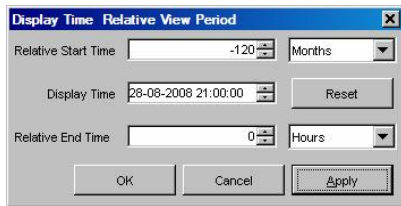
Shortcuts



6.5 How to obtain a duration curve

- Select <Duration curve> in the drop down menu next to functions (top bar).

The period for which the duration curve is generated must be selected before choosing the duration curve option. This can be done by clicking the display time (at the bottom of the screen) or using the zoom and pan functionality. If you wish to change the period of the duration curve, first deselect the duration curve function, change the view period and then reselect.



6.6 How to obtain a descriptive summary (statistics)

View the statistical detail by clicking on the <Statistics> button. Select another column in the table to obtain the summary of another time series. Similar to the duration curve, the statistics apply to the period over which the data is viewed. You can change the period by zooming in or out or by double clicking on the “display time”.



6.7 How to navigate in Graphs

6.7.1 Zoom in and out via the mouse wheel

- Zooming in and out can be done with help of the scroll wheel of the mouse. Scrolling away from the user results in zooming in while scrolling towards the user results in zooming out.

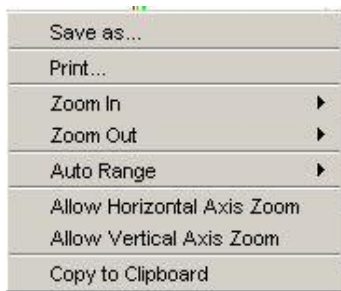
6.7.2 Horizontal panning with right mouse drag

- The Graph can be dragged horizontally by pressing the right mouse button, dragging the graph and releasing the button.

6.7.3 Via the right mouse menu

Zooming is also possible by selecting a zoom range. Drag the mouse holding down the right button to form a rectangular area to zoom in to.

When clicking the right mouse button, the dropdown menu presented below appears. The menu gives you some additional options.



Save As: You can save the graph to file with this option.

Print: This option allows you to print the graph.

Zoom in/ out: You can select to zoom in and out along one or both axis with this option.

Allow Vertical / Horizontal Axis Zoom: You can select to allow for zooming in and out along one of the axis with this option.

Auto Range: This feature allows you the set automatic scaling along one or both axis.



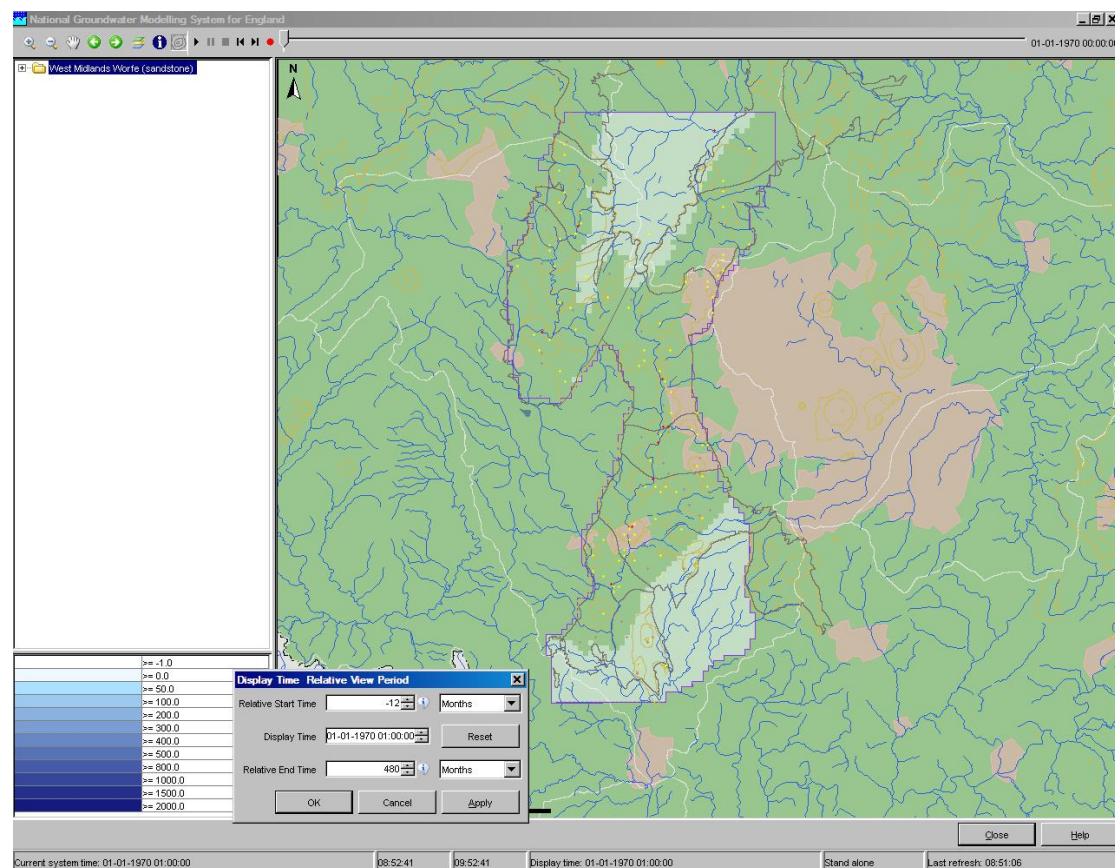
Finally, the top of the display also offers zoom buttons to zoom in (Ctrl+), zoom out (Ctrl-) or go back to the default zoom (Ctrl 0). Furthermore, the green arrows allow to switch back/forward to the previous view.

7 How to work with the spatial display

7.1 Opening the display

Open the Spatial display by clicking on <Spatial plots> in the tool bar of the Explorer. dependent on the length of the model run, and the local availability of the data, it may take some a few seconds before data is animated. The sand bar mouse icon will indicate when it is busy to obtain data.

Note: since the Modflow computation produces result at the end of the stress period, the first date in the run, i.e. the initial situation, may have no results.



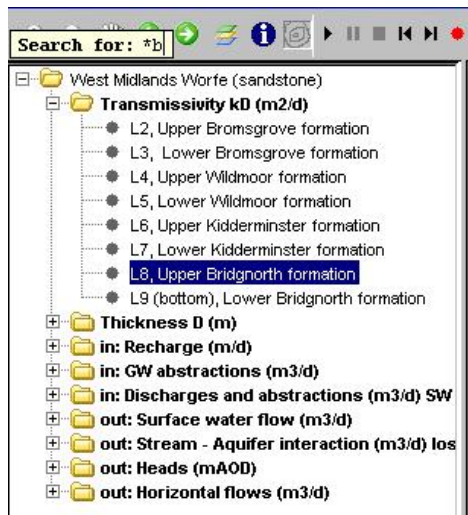
7.2 How to open data

7.2.1 Via opening folders

- To open folders, double click folder or single click '+'

7.2.2 Via data search

- To search for a data item, select the panel and start typing. The search method will look for the line which starts with your search characters
- use '*' for wildcards, (i.e. searches the character combination anywhere in the lines)



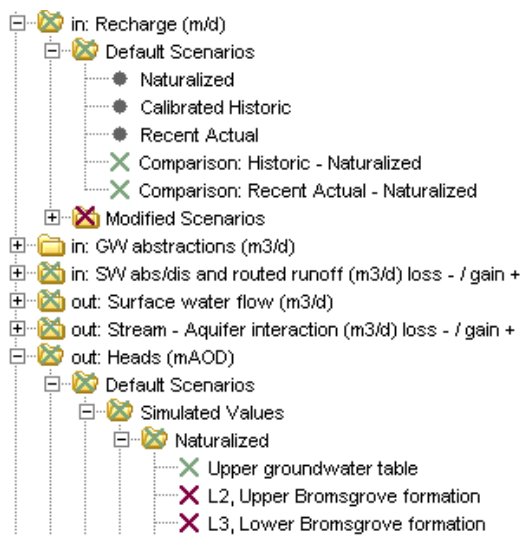
7.2.3 Data availability

In the folder structure you can see if there is data available.

purple cross = no data is available

red cross = data is available, but not in the selected time range or for this specific run.

green cross = meta-data is available, but the actual data will be downloaded on-the-fly.



7.3 How to navigate on the map

7.3.1 Using the mouse and the menu bar

- Zooming can be done directly by pointing the mouse at map and scrolling the wheel. The map zooms centrally around the mouse pointer.
 To see more of the left side of the map, point the mouse at the right side of the map and scroll.
- Panning can be done by dragging the mouse while the right mouse button is pressed. An alternative is to use the click zoom/pan buttons in the upper left corner.

- Map layers can be added/removed using the “layers” icon – as in the main explorer display



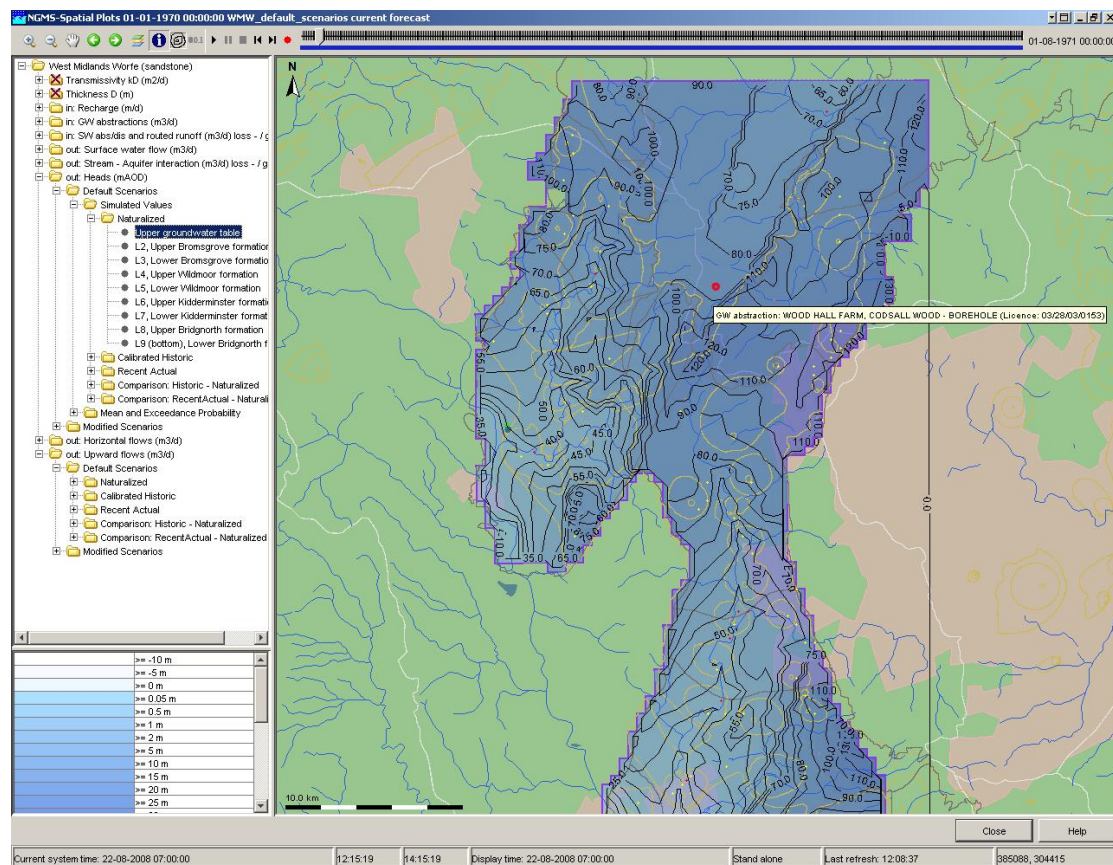
7.3.2 Animations and recording an AVI file

- With the play, pause, stop, next buttons you can navigate through the time steps available in the display.
- To record an animation click the record button, and choose a location to save the file. The movie will then start to record. The period (set by double clicking on the “display time”) and the current view will be used for the movie. To stop recording at any time press the stop button.

7.3.3 Tooltip

The tooltip provides information available in the GIS-layer, e.g. the name of a location or river.

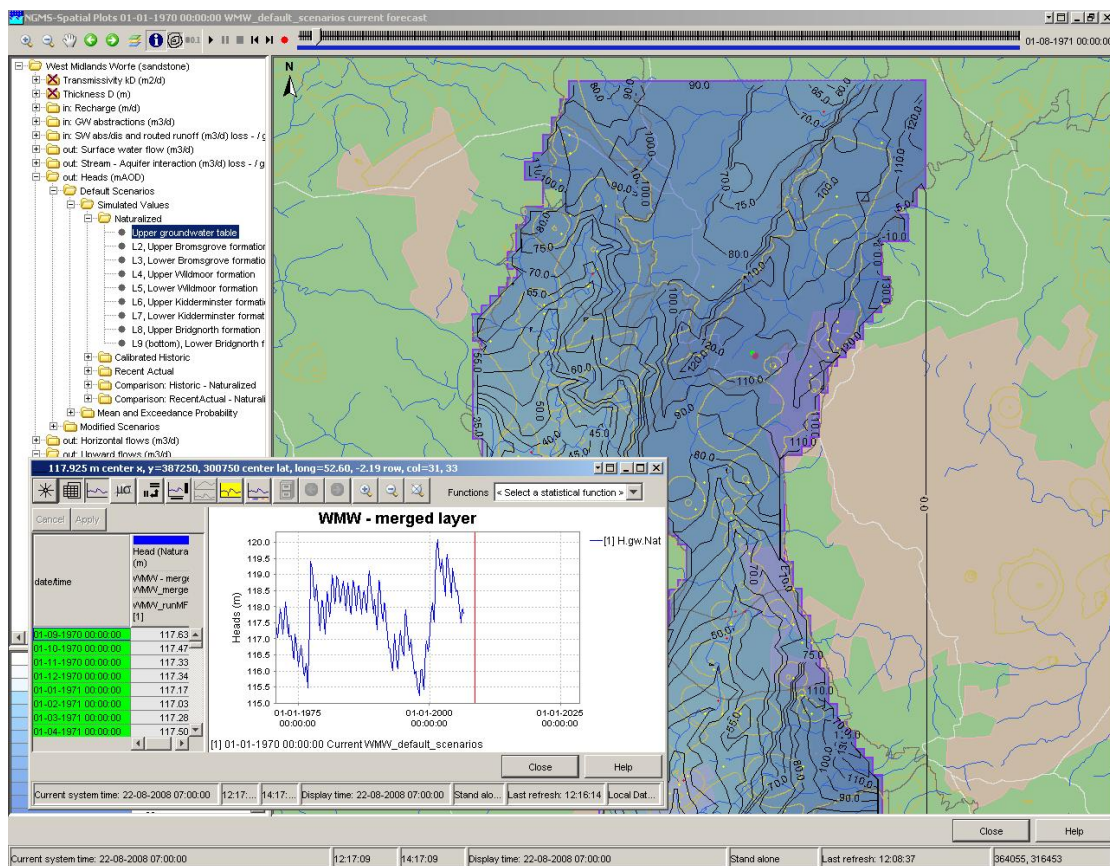
- Click on the <Tooltip> button, the ‘i’ in the toolbar.
- Move your mouse cursor over a shape.



7.4 How to obtain a graph in time for a specific point

- Double click the plot to popup a graph of this data set.
- If the map is animated, a slider will show the progress on the graph

- The system allows a user to swap to another data set while a graph is open and in animation. This allows the user to combine different sets of animations in one view.



7.5 How to obtain a cross section/side view

For regular grids, the user can drag their own single or multi-point cross section and obtain a side view.

7.5.1 Drawing the profile via the right mouse menu

- Click with right mouse button on the map to select your start point
- Select <Start Drawing Profile (Ctrl)>
- Single left click to place an intermediate point
- Double left click to set the end point and release the sketch.

1 Draw Point (single click)
3 Start Drawing Profile (Ctrl+click)
5 Start Drawing Area (Shift+click)
B Load Sketch From Shape File
E Save Frame As PNG File
F Save Frame As ASCII Grid File
G Rescale Classification
H Back To Default Classification

7.5.2 Drawing the profile via a short cut

- Keep Ctrl pressed while clicking the start point with your left mouse button
- Release the Ctrl-key
- Single left click to place an intermediate point

- Double left click to set the end point and release the sketch.

7.5.3 Retrieving the time series for this dataset

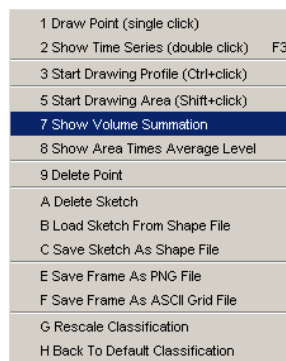
- Click with right mouse button on the map to select your start point
- Select <Show profile (F2)>
As a result the time series display pops up with the single time series This window can be decreased to place it next to the map.

Retrieving the time series for multiple layers

- After a map has been activated in the previous step, you can select the associated folder to obtain time series graphs for all maps defined in this folder
- Select <Show profile (F2)>
As a result the time series display pops up with all time series defined in the plotgroup. This window can be decreased to place it next to the map.

7.5.4 Drawing an Area to compute a flow balance

A click on the right mouse button also allows for the opportunity to draw an area. In the same way as drawing a profile, click on the grid and then double click to close the area. Once an area is drawn right clicking will make the additional options “Show Volume Summation” and “Show Area Times Average Level”



7.5.5 Deleting the sketched

- Click with right mouse button on the map to select your start point
- Select <Delete Point/Sketch>

7.5.6 Additional Functionality

In addition to the drawing functionality, right clicking in the spatial display also gives the options:

- To save or load a sketch in an ESRI shapefile format (GIS file).
- To save the current frame as an image (png format) or as a grid (ASCII format).
- To rescale the classification legend in the lower left corner of the display to better suit the values in the current frame. You are also able to revert back to the default settings.

8 How to operate the Scenario Editor (Scenario Dialog)

8.1 Background

To define a new scenario or to add extra abstraction locations the Scenario Editor can be used. This editor can be activated by selecting <Scenarios> in the Explorer toolbar.

The Scenario Editor allows scenario specification and dispatching per model area and run type. A scenario is always derived from a default run such as a Recent Actual run or the Fully Licensed run.

The upper left part of the Scenario Editor allows selection of the area of interest and the run from which the scenario is derived. The associated right panel provides on the default run and the available starting conditions.

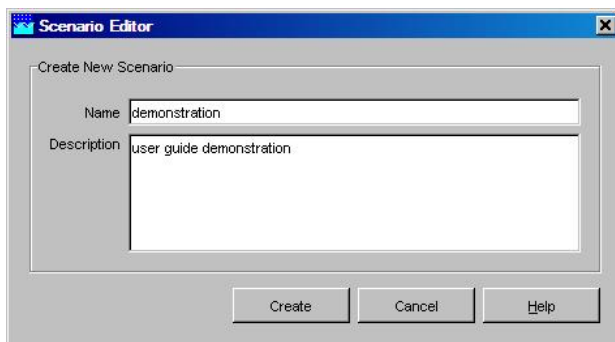
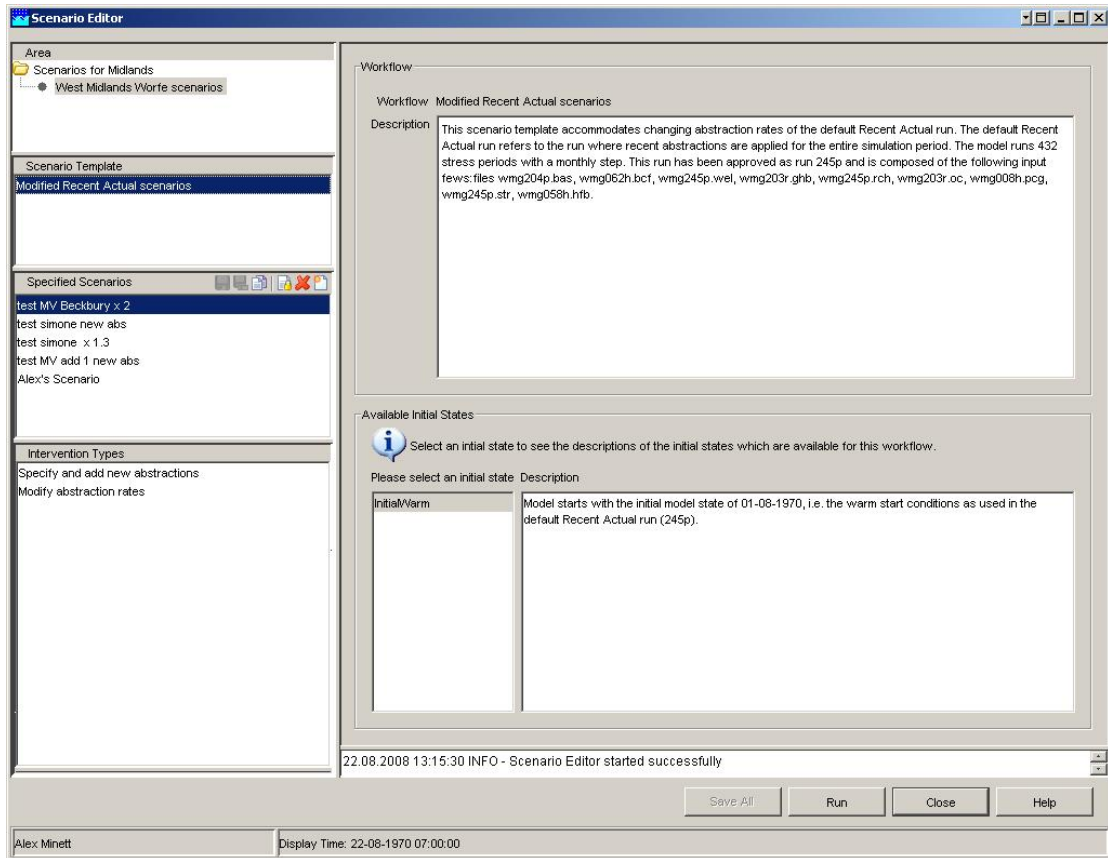
The middle part lists the scenarios defined. The icons allow the user to manage the scenarios: i.e. create new, save, save as, copy, lock etc.

The lower left part allows selection of the specific interventions. If the user is active in this area, the right panel is used to specify the exact intervention to be applied.

8.2 How to create and manage scenarios

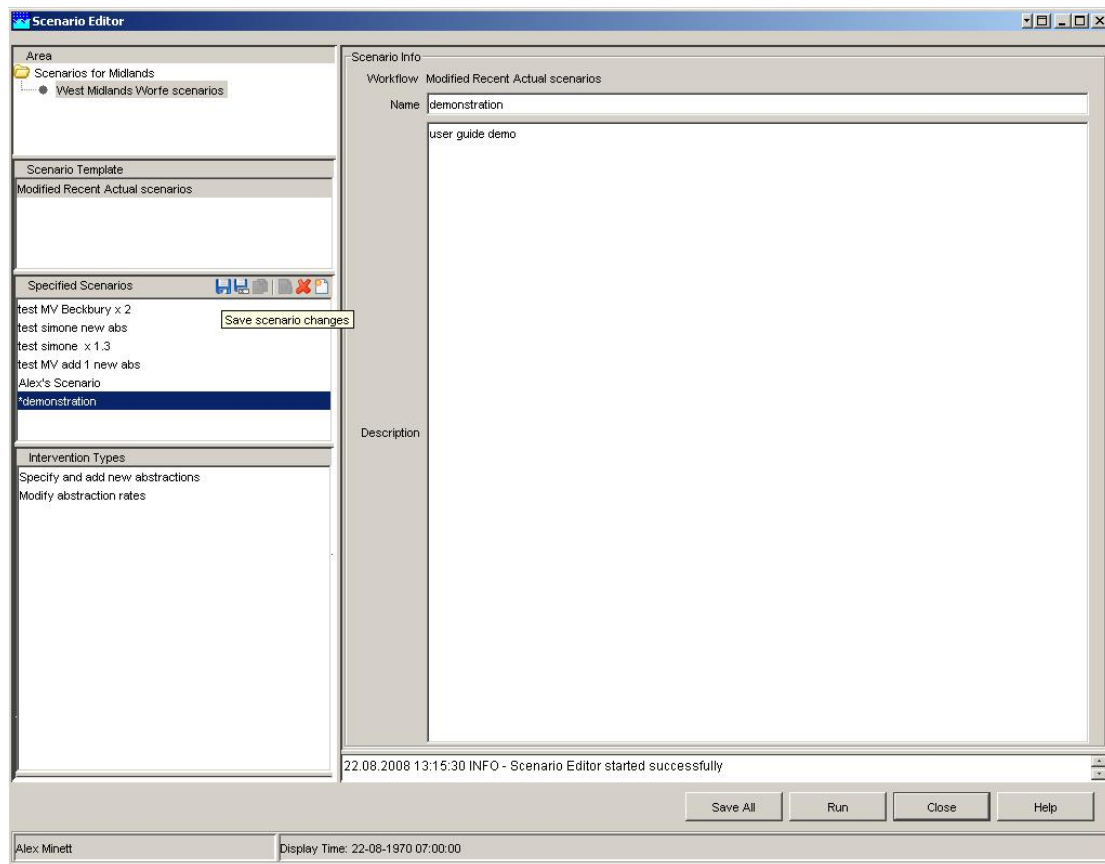
8.2.1 Defining a new scenario

- Go to the top left list box (Area)
- open the folder and select the model area to be used
- Go to the Scenario Templates list
- Select with your mouse the template for the scenario to apply, e.g. “Modified Recent Actual scenarios.” Note that the right panel will show background information on this type of run.
- Select <Create new scenario> via the icon or a right mouse click
- Define the name of your scenario. (for example: “Demonstration”)



8.2.2 How to save your scenario

- Select the relevant scenario in the <Specified Scenarios> panel
- Click <save scenario changes> (save button)



Alternative, use the ‘Save all’ button at the bottom of the editor. Note that this will save all scenarios which are or have been modified.

A scenario change is indicated by the ‘*’ in front of the scenario name.

8.2.3 How to lock your scenario

If you are satisfied with your scenario and do not want anyone to change it, you should ‘lock’ it. A locked, or persistent, scenario cannot be modified. Deletion can only be done by system administrators.

- Within the <Specified Scenarios> list, select the scenario to lock
- Click <lock scenario for changes> (4th button or right mouse menu)
- The system informs you that this action cannot be rolled back.
Click <continue>
- The scenario is locked for future editing, but it can still be used to run models.

Scenario Editor

Area
 Scenarios for Midlands
 West Midlands Worfe scenarios

Scenario Template
 Modified Recent Actual scenarios

Specified Scenarios
 Lock the scenario for changes
 test MV Beckbury x 2
 test simone new abs
 test simone x 1.3
 test MV add 1 new abs
 demonstration
 Alex's Scenario

Intervention Types
 Specify and add new abstractions
 Modify abstraction rates

Specify details for new location

Site Name
 Licence
 Easting 380,000
 Northing 300,000
 Model layer 2

New locations specified

Site Name	Licence	Easting	Northing	Model-x	Model-y	Model layer
Demo		380000.0	300000.0	380250.0	300250.0	2

Explanation | Map | Graph

New well No.1

Abstractions (m3/d)

22.08.2008 13:38:53 INFO - Scenario (id: 27_0000002, name: demonstration) successfully updated.

Alex Minnett Display Time: 22-08-1970 07:00:00

Save All Run Close Help

Persist Scenario

Are you sure you wish to mark this scenario as persistent? This action cannot be undone!
 Once a scenario is marked as persistent no further alterations can be made.

Continue Cancel

8.2.4 How to keep your 'original' scenario while you have modified it

If you are editing a scenario by accident, you can save it as a new one to preserve the settings of the old one.

- Click <save scenario changes as new scenario> (2nd button)
- Enter a new name.

NB this only works if you did not save the changes you made to the original one

The screenshot shows the Scenario Editor software interface. The main window is titled 'Scenario Editor'. On the left, there is a sidebar with 'Area' (Scenarios for Midlands, West Midlands Worfe scenarios), 'Scenario Template' (Modified Recent Actual scenarios), 'Specified Scenarios' (test MV Beckbury x 2, test simone new abs, test simone x 1.3, test MV add 1 new abs, demonstration, Alex's Scenario), and 'Intervention Types' (Specify and add new abstractions, Modify abstraction rates). The main area is divided into several sections: 'Specify details for new location' with fields for Site Name, Licence, Easting (380,000), Northing (300,000), and Model layer (2); 'New locations specified' with a table showing 'Demo' at Easting 380000.0, Northing 300000.0, Model-x 380250.0, Model-y 300250.0, Model layer 2; and a graph titled 'New well No.1' showing 'Abstractions (m3/d)' on the y-axis (40.000 to 40.100) and time on the x-axis (01-01-1980 to 01-01-2010). A legend indicates 'Q.abs.gw.RecAct new abstraction well'. At the bottom, a status bar shows 'Alex Minett' and 'Display Time: 22-08-1970 07:00:00'. Buttons for 'Save All', 'Run', 'Close', and 'Help' are visible.

The screenshot shows the 'Create New Scenario' dialog box in the Scenario Editor software. It has a title bar 'Scenario Editor' and a close button. The dialog is titled 'Create New Scenario' and contains two input fields: 'Name' with the text 'lopk way out' and 'Description' which is empty. At the bottom, there are three buttons: 'Create', 'Cancel', and 'Help'.

8.3 How to modify existing time series

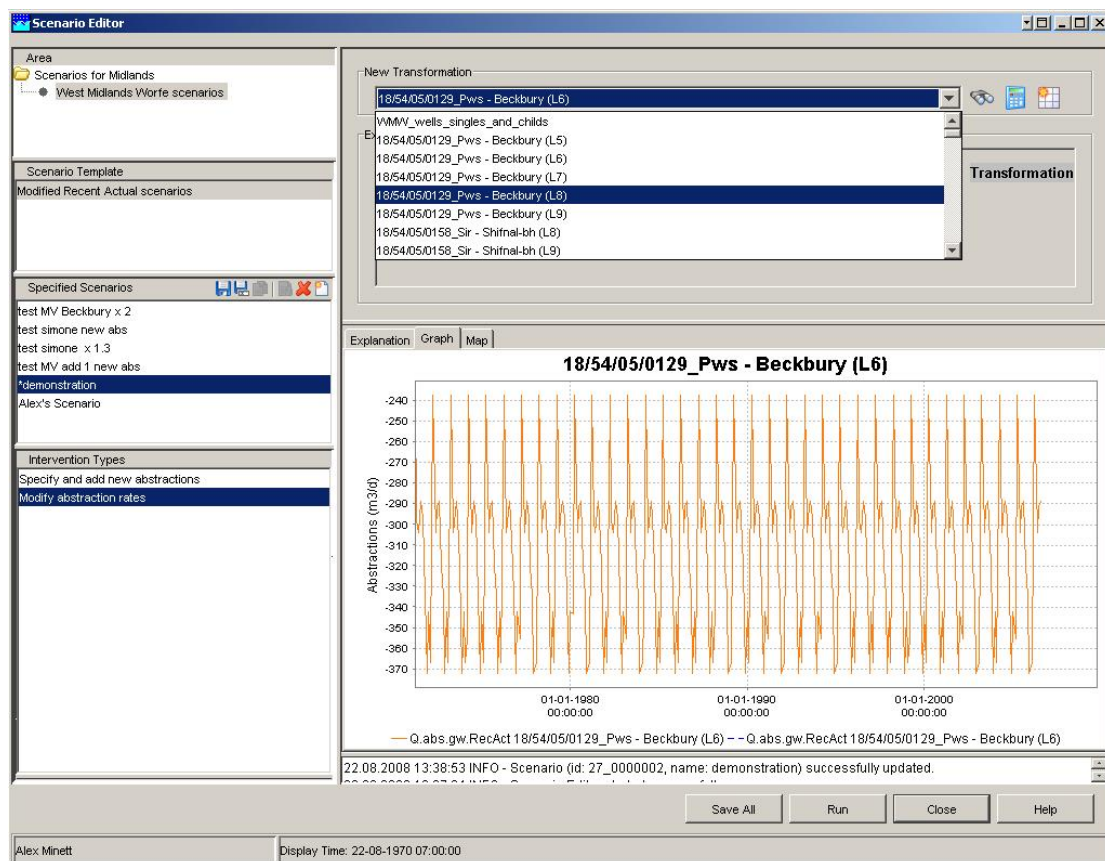
8.3.1 Select the intervention type

To modify existing time series such as abstractions rates, do follow the next steps:

- Select the scenario of interest or create a new one.
- Go to Intervention types field
- Select “Modify abstraction rates”
- Go to the top right panel (New Transformation)
- Read the explanation panel at the bottom

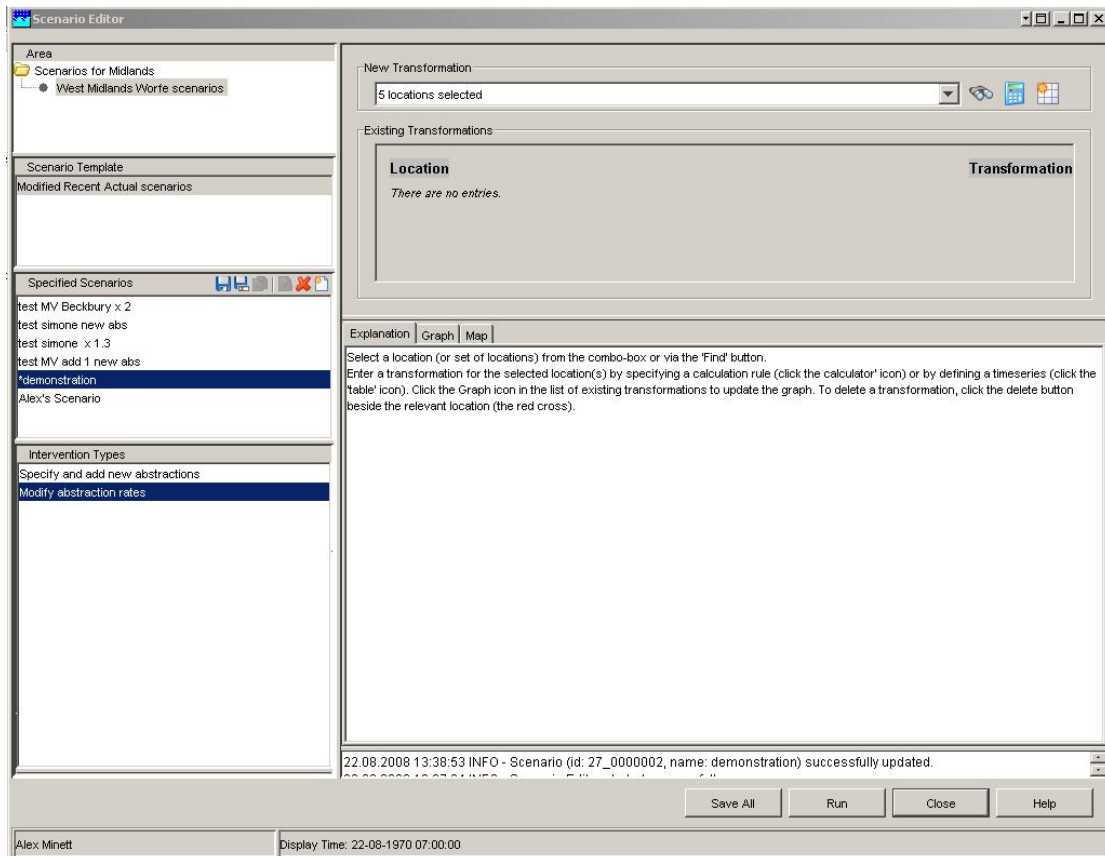
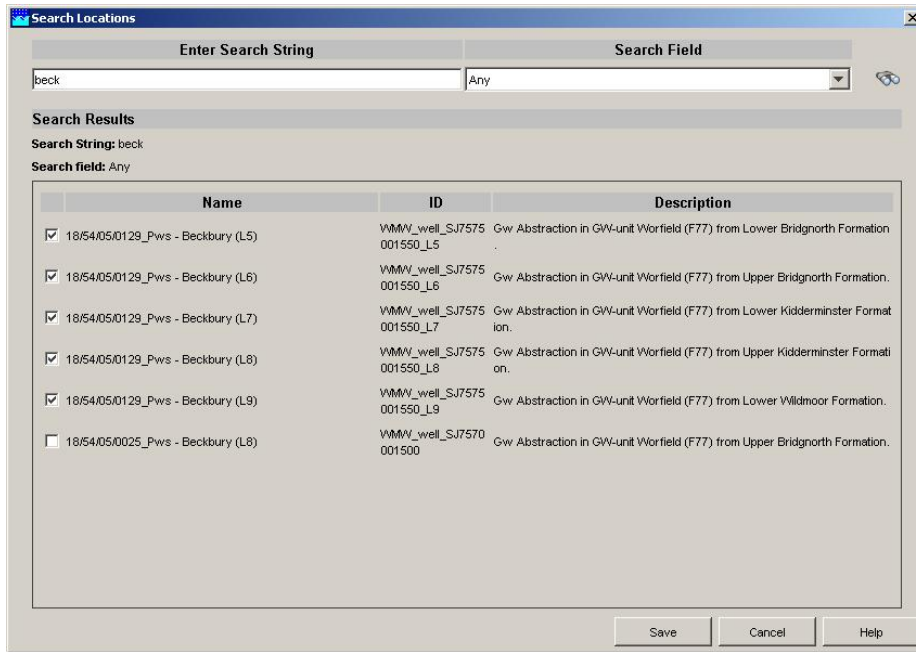
8.3.2 Select a location from the combo box

- Select a location from the combo-box.
- The combo box offers a selection of the full location set (i.e. all locations) or each one individually.
- Select the calculator button to formulate the modification (see next section).

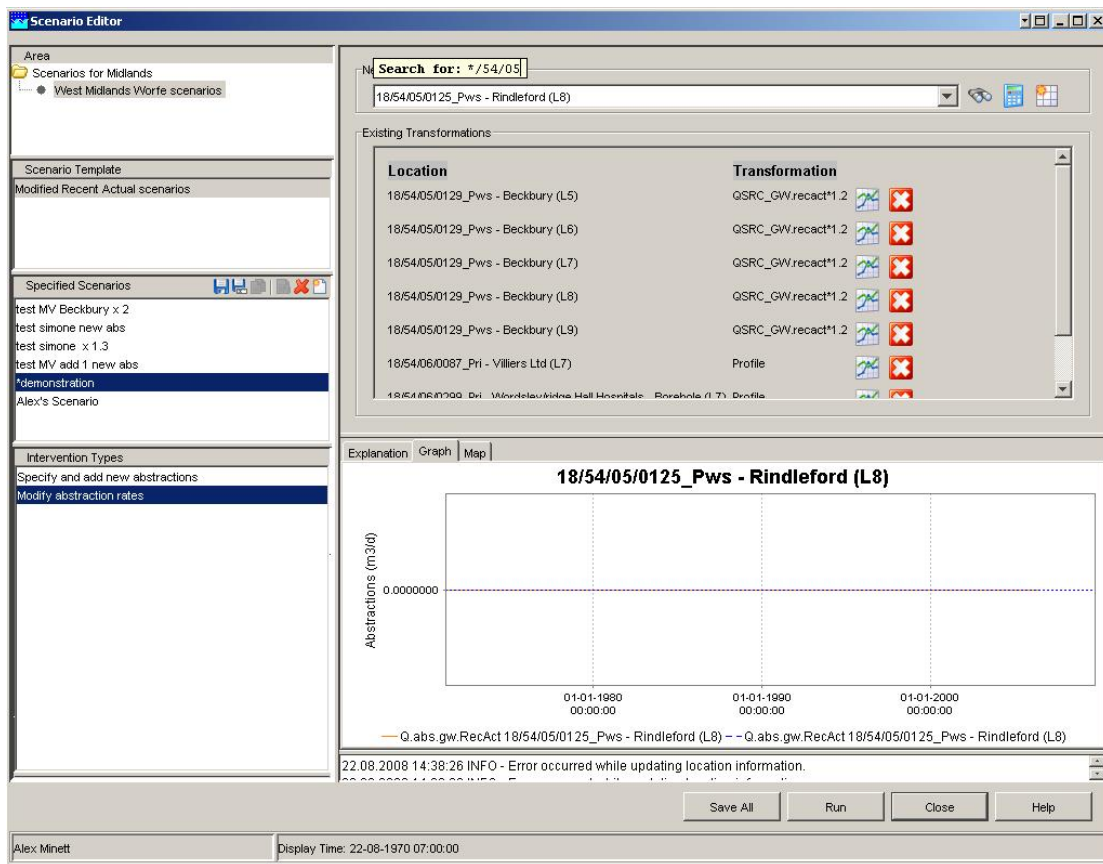


8.3.3 Search a location for time series modification

- Use the 'Find' (binocular) button to search for a location or a set of locations.
- Enter the name or code of the location and press Enter or the binocular.
- Select the location(s) of interest and press save to confirm your selection.



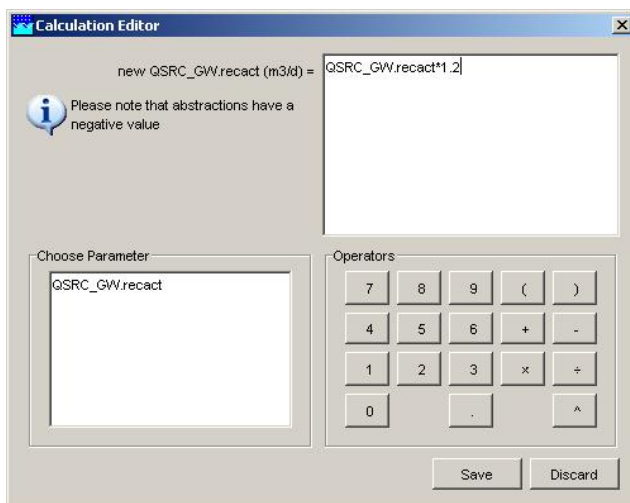
In order to find a location you wish to modify you can also just start typing the drop box. This type of searching also supports the search wildcard *.

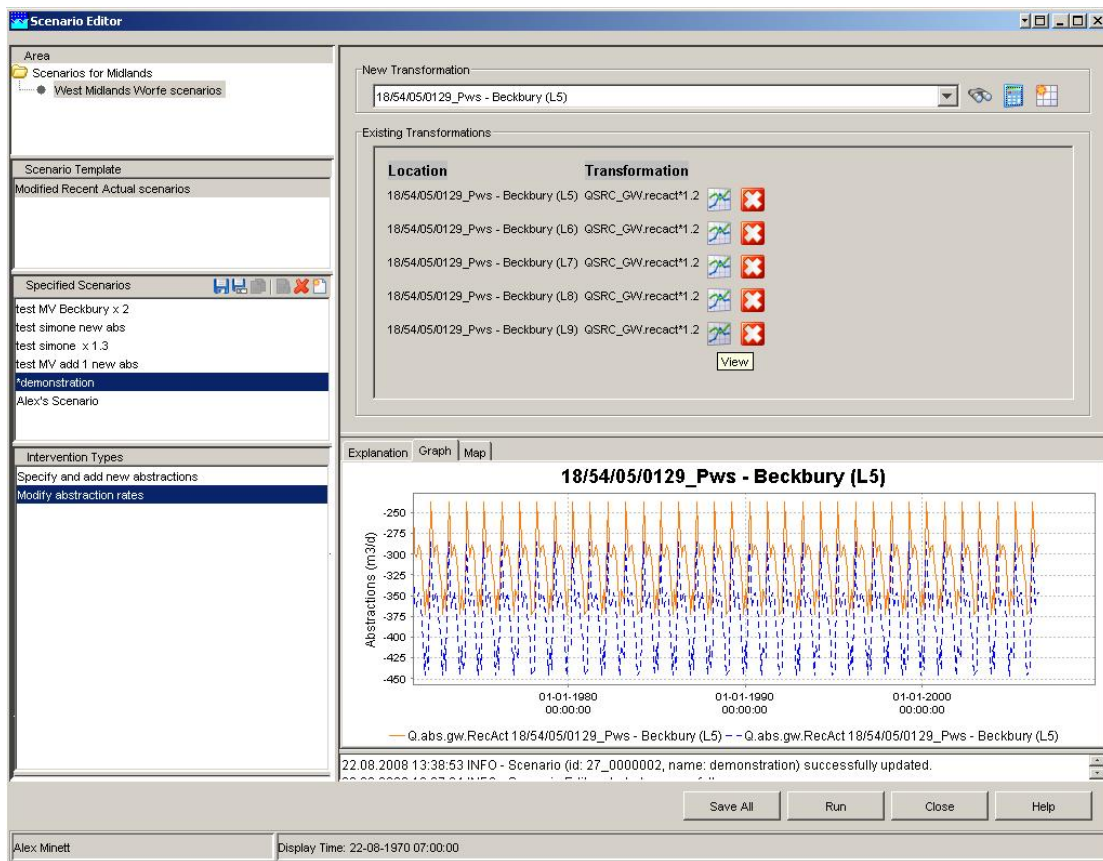


8.3.4 How to define a time series modification using a formula


A modification can be defined by means of a formula or a table.

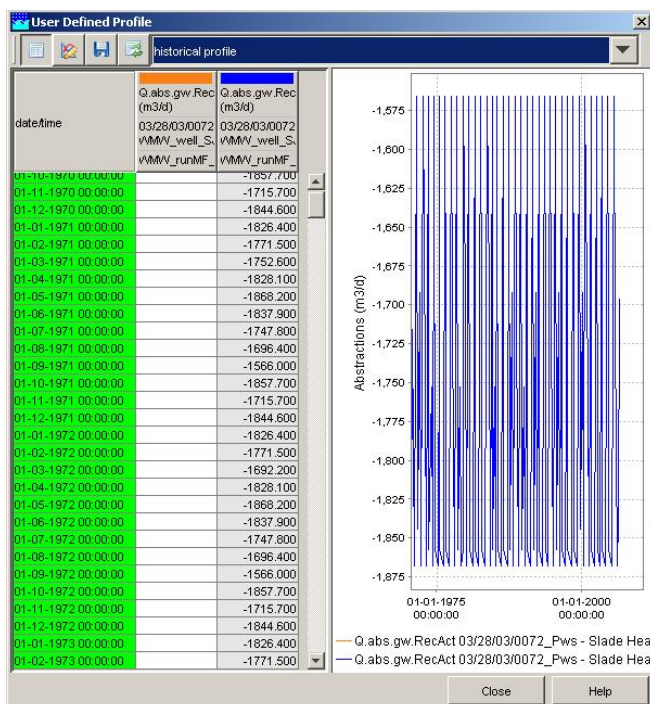
- Open the Calculation Editor by clicking the calculator.
- Enter a formula/calculation rule. Please note the unit and sign conventions on the editor. The formula as specified will be applied for the location(s) selected.
- Confirm the formula. A list of locations with formulas will appear.



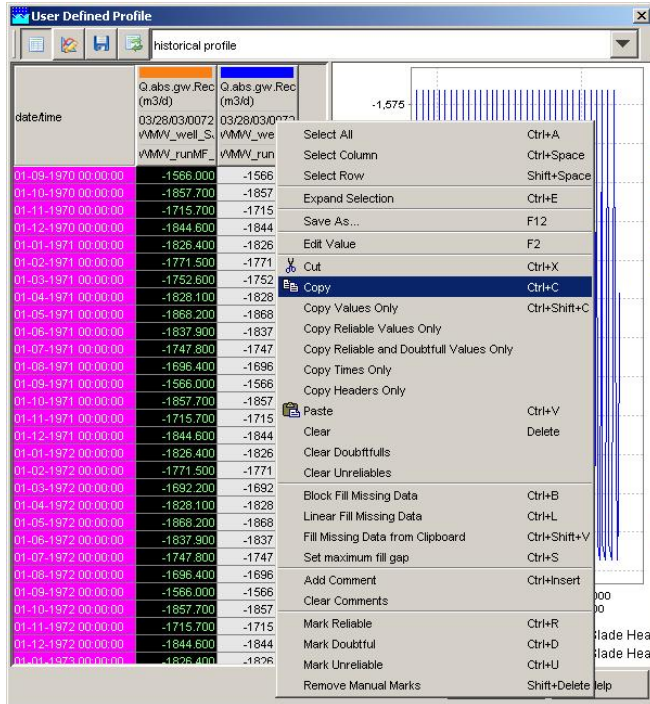


8.3.5 How to modify an existing series

In order to modify an existing series choose the series from the “New Transformation” dropdown box then click the  icon. Then choose “historical profile” from the drop down box. This will bring up the historical abstraction (with blue header).



The series to be used in the scenario is the column with the orange header. To copy the data from the right to left column, right click on the header and select “Copy” then right click on the header of the left (orange) column, right click, then “Paste”. **Please note that abstractions should be entered as a negative value!**



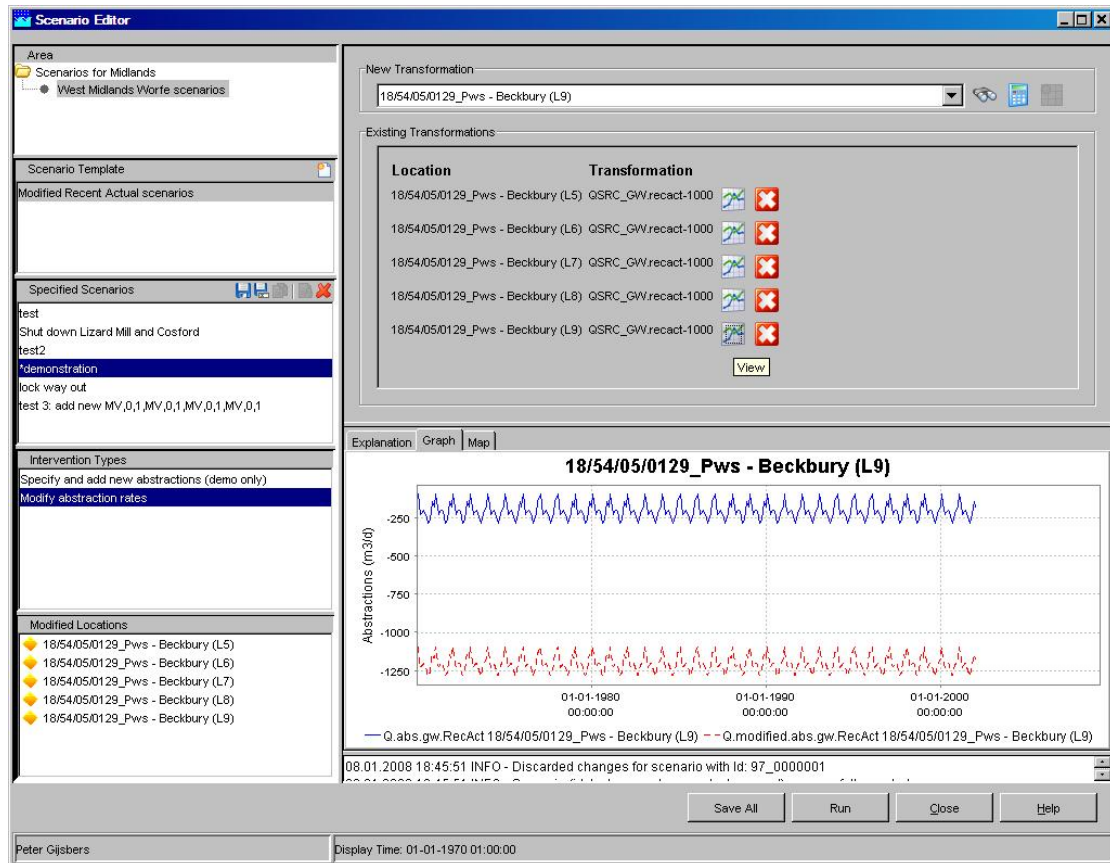
In addition to a ‘historical profile’ which is tied to the year as seen in the table, one may also choose an ‘annual’ profile or a ‘typical’ profile.

The annual profile will show a table with the stress period interval as repeated for every year. The time series entered in this table will be repeated for every year.

When the typical profile is selected, the time series will be stored for ‘relative’ to t0, the start time of the run. This mode is not foreseen the most obvious choice for NGMS uses other than real forecasting applications (e.g. drought forecasts).

8.3.6 Viewing the modification in comparison to the original data

- Click the Graph icon in the list of existing transformations to update the graph.
- If required, select the graph worksheet to view the original and the modified time series



8.3.7 How to manipulate a transformation which is incorrectly defined

- Ensure that the proper location is active (either via the combo box or by clicking the graph icon)
- Click the calculator to open the editor
- Modify the formula and confirm
- To delete a transformation, click the delete button beside the relevant location (the red cross).

8.4 How to define a new location with associated time series

8.4.1 Defining the location

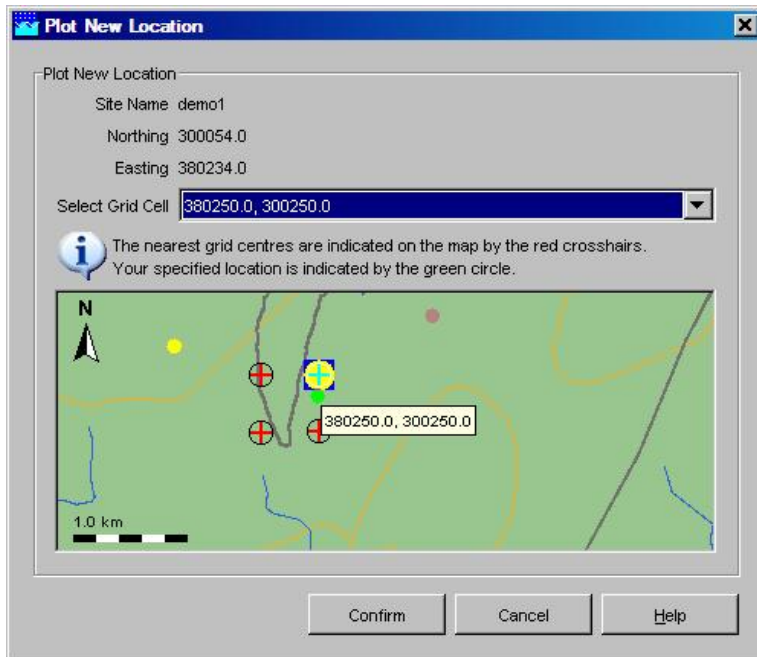
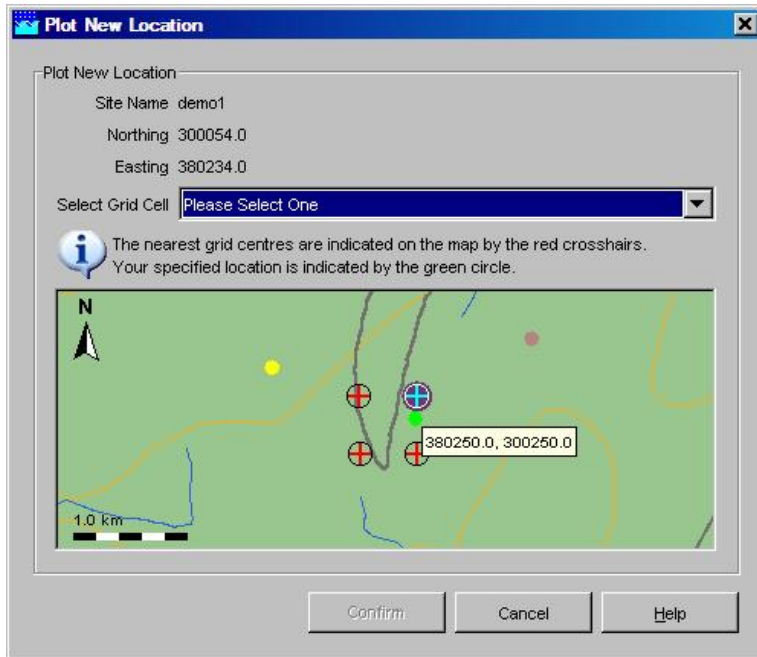
Please ensure that you do the steps in the order as specified. An incorrect order may result in failure messages.

- Ensure that your display time is set at the beginning of period for which new values will be entered
- Go to the scenario to modify
- Select “Specify and add new abstraction” in the intervention type field
- Go to the top right panel “Specify details for new location.”
- Fill the properties

The screenshot shows the Scenario Editor interface. On the left, there are several panels: 'Area' (showing 'Scenarios for Midlands' and 'West Midlands Wortle scenarios'), 'Scenario Template' (showing 'Modified Recent Actual scenarios'), 'Specified Scenarios' (listing various test scenarios and 'demonstration'), and 'Intervention Types' (with 'Specify and add new abstractions' selected). The main area is titled 'Specify details for new location' and contains input fields for 'Site Name', 'Licence', 'Easting' (380,000), 'Northing' (300,000), and 'Model layer' (2). Below this is a table of 'New locations specified' with columns for Site Name, Licence, Easting, Northing, Model-x, Model-y, and Model layer. The table contains one row: 'Demo', '380000.0', '300000.0', '380250.0', '300250.0', '2'. Below the table are 'Explanation', 'Map', and 'Graph' tabs. The 'Explanation' tab is active, showing instructions: 'Please ensure that the display time is correctly specified for the time series before defining a new location. Specify the location details and click the 'Globe' icon to assign the specified location to the model grid. After confirming the appropriate grid point, a time series can be defined by clicking the 'table' icon. Once all data has been specified, the new location can be added with the green Confirm button. Click the Graph icon in the list of new locations to update the graph. To delete a new location, click the delete button beside the relevant location (the red cross).' At the bottom, there is a status bar with 'Alex Minett' and 'Display Time: 22-08-1970 07:00:00'. A message box at the bottom right says: '22.08.2008 13:38:53 INFO - Scenario (id: 27_0000002, name: demonstration) successfully updated.'

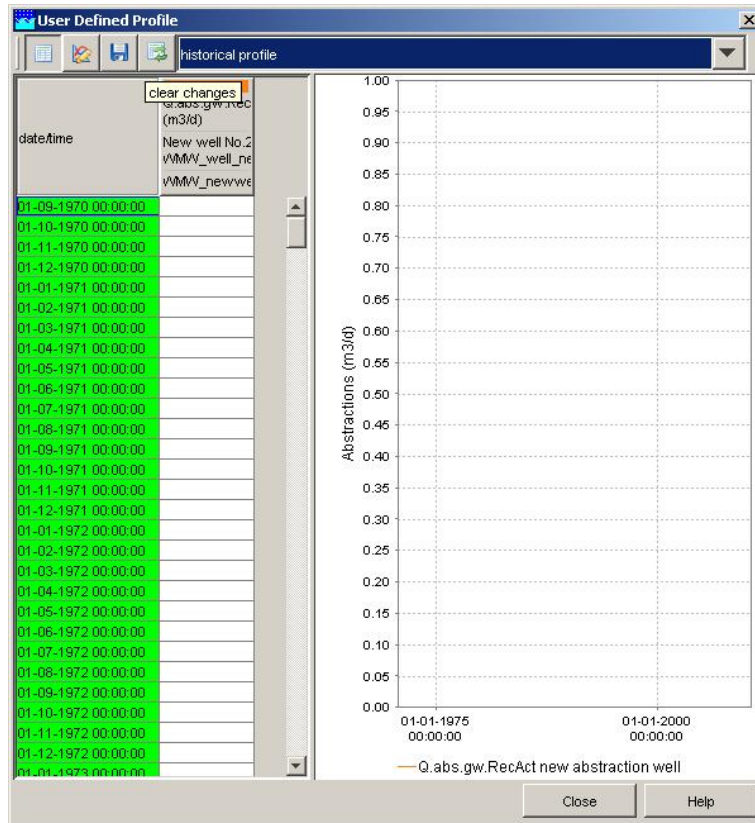
Site Name	Licence	Easting	Northing	Model-x	Model-y	Model layer
Demo		380000.0	300000.0	380250.0	300250.0	2

- Click the 'Globe' icon to assign the specified location to the model grid.
- Choose a grid point from the map or the combo-box and confirm the appropriate grid point



8.4.2 Defining the associated time series

- Clicking the 'table' icon to define the associated time series.
- Select the proper profile type (Historical, Annual, Typical)
- Fill the table. Ensure that each record is filled with a value
It is also possible to paste (Ctrl+V) the records from e.g. Excel
- Close the table editor



8.4.3 Confirm the new location


- Once all data has been specified, the new location has to be confirmed by clicking the green Confirm button.

8.4.4 Managing and manipulating new locations

The screenshot shows the Scenario Editor interface. On the left, there are panels for 'Area' (Scenarios for Midlands, West Midlands Worfe scenarios), 'Scenario Template' (Modified Recent Actual scenarios), 'Specified Scenarios' (listing various test scenarios and 'demonstration'), and 'Intervention Types' (Specify and add new abstractions, Modify abstraction rates). The main area is titled 'Specify details for new location' and contains input fields for Site Name (Demo1), Licence, Easting (380,000), Northing (300,000), and Model layer (2). Below this is a table of 'New locations specified':

Site Name	Licence	Easting	Northing	Model-x	Model-y	Model layer
Demo		380000.0	300000.0	380250.0	300250.0	2

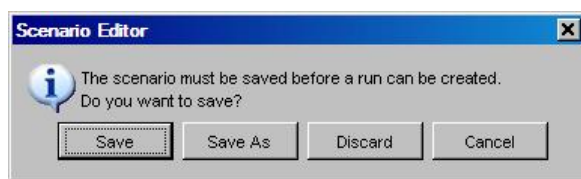
Below the table is a graph titled 'New well No.1'. The y-axis is 'Abstractions (m3/d)' ranging from 40.000 to 40.100. The x-axis shows time intervals from 01-01-1980 to 01-01-2000. A legend indicates 'Q.abs.gw.RecAct new abstraction well'. A status bar at the bottom shows a message: '22.08.2008 13:38:53 INFO - Scenario (id: 27_0000002, name: demonstration) successfully updated.' Buttons for 'Save All', 'Run', 'Close', and 'Help' are visible.

- To view a graph of the new location, click the Graph icon in the list of new locations and switch to the graph worksheet.
- To modify the time series, click the  icon. The table editor will open. Note that this action is considered a data change even if you haven't changed any data.
- To delete a new location, click the delete button besides the relevant location (the red cross).

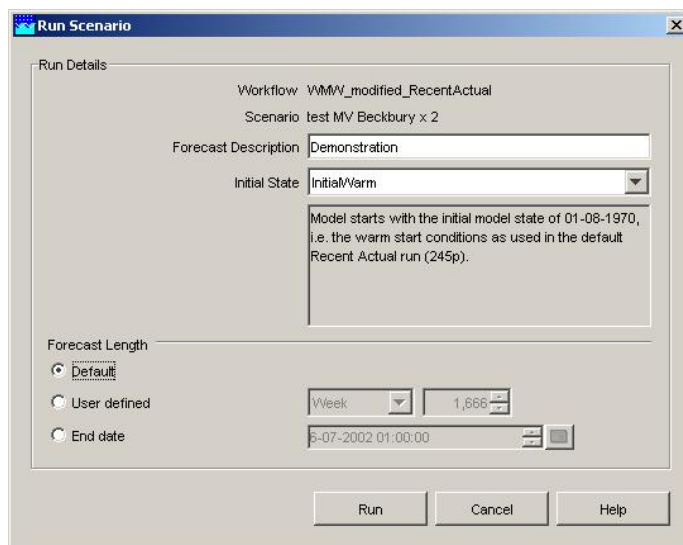
8.5 How to run a scenario

8.5.1 Dispatching a run

- Ensure that you've selected the proper scenario to run.
- Click the <Run> button at the bottom of the window.
- Before running the scenario you have to save the specified scenario. If you have not already done it, either via the icons or via the <Save All> button, you will get the following message.
- Cancel will go back to scenario editor mode without saving the scenario.
Discard will discard your scenario
Save and Save as will save your scenario



If the scenario is saved, the Run Dialog appears.



- Provide a relevant name for the run (e.g. a combination of name and state used)
- Select the relevant initial state from the Initial state combo-box
- The “Forecast Length” gives the option to change the default run length of 10 years. The “User defined” option allows you to specify the forecast length. The “End date” option is used to adjust (shorten or lengthen) the run length using a calendar.
- Click <Run>
- The editor will inform you that the run has been dispatched
Click <OK>



The model is running.

- Close the editor to go to the Explorer window.
- In the log panel you will see the log messages of the dispatched run.
- You can also monitor the task run in the system monitor.
- The run is completed when a message pops up into your screen.

Once dispatched, the Operator Client can be closed while the run is executed at the central system. However, the notification of completion will only appear as a popup when the operator client remains open.

8.5.2 How to detect completion of a run

As indicated you can monitor the task run in the system monitor display (tab Running forecasts). An alternative is to open the Data Management window (Forecast Manager) once in a while and check if the new run appears in the panel at the central database.

Note: for both checks one should be logged in to the server.

8.5.3 How long will a run take?

When a run is sent off, the Master Controller will select a Shell Server (i.e. machine) to execute this activity. Each run is composed of the following steps:

- runMF: adjusts Modflow input (WEL, RCH, STR files, if needed), executes Modflow, converts and imports model results
- QTRIB: derives tributary inflows to the main river branches as computed by the Modflow model
- Interp: Interpolates grid data to point locations and accretion profiles
- Budgets: computes flow budgets
- Statistics: computes statistics (mean, and percentiles) for selected parameters
- Compare: compares whatif-results against default runs, or Calibrated Historic/Recent Actual/Fully Licenced against Naturalized run

The table below gives an overview of all the runtimes (in minutes) for all regions for a set of models. The workflows ran on the Forecasting Shell server machines on the Environment Agency network. The runtimes are abstracted from the log files for each of the processing steps in the workflow.

Region	Model	Workflow	RunMF	QTRIB	Interp.	Budgets	Statis.	Compare	Total
Anglian	YNN	Naturalized	340'33	3'04	9'45	1'45	1'22		356'30
Anglian	YNN	Historic	358'50	2'55	9'50	1'50	1'12	80'42	455'22
Anglian	YNN	FullyLicenced	359'20	2'53	9'18	1'45	1'11	88'02	462'33
Anglian	YNN	Def_Scenarios							1274'26
Anglian	EO	Naturalized	368'09	1'27	5'52	2'32	2'43		380'47

Anglian	EO	Historic	347'16	1'55	6'02	2'34	2'54	53'15	413'58
Anglian	EO ²	RecentActual							
Anglian	EO	FullyLicenced							
Anglian	EO	FullyLicencedS							
Anglian	EO	LongTermAverage							
Anglian	EO	Def_Scenarios							
Midlands	WMW	Naturalized	12'26	0'10	0'30	0'07	0'23		13'41
Midlands	WMW	Historic	13'50	0'09	0'26	0'07	0'22	7'47	22'44
Midlands	WMW	RecentActual	13'41	0'09	0'28	0'07	0'08	7'18	21'55
Midlands	WMW	Def_Scenarios							58'23
NorthEast									
NorthWest	LM	Naturalized	63'07		0'21	0'20	0'01		63'50
NorthWest	LM	Historic	24'45		0'03	0'07	0'00	17'45	42'42
NorthWest	LM	RecentActual	29'47		0'04	0'09	0'00	19'47	49'49
NorthWest	LM	FullyLicenced	71'37		0'25	0'20	0'05	34'11	106'41
NorthWest	LM	Def_Scenarios							263'03
Southern	EK	Naturalized	66'33	0'23	0'56	0'15	0'48	-	68'57
Southern	EK	Historic	72'09	0'22	0'58	0'15	0'30	19'28	93'45
Southern	EK	RecentActual	73'08	0'23	1'02	0'16	0'45	20'52	96'29
Southern	EK	FullyLicenced	89'10	1'03	1'06	0'28	0'58	25'50	118'38
Southern	EK	Def_Scenarios							377'52
Southern	TI ³	Naturalized	76'12	1'33	2'36				80'22
Southern	TI	Historic	80'32	1'15	3'04			15'31	100'26
Southern	TI	FullyLicenced	81'02	1'44	2'38			17'22	102'49
Southern	TI	Def_Scenarios							283'40
SouthWest	HA	Naturalized	205'28	2'54	11'00	3'16	6'13		228'44
SouthWest	HA	Historic	209'13	2'43	11'20	3'10	6'17	71'45	304'31
SouthWest	HA	RecentActual	211'02	2'50	11'15	3'10	6'14	72'38	307'13
SouthWest	HA	FullyLicenced	208'23	2'56	11'27	3'16	6'12	72'06	304'23
SouthWest	HA	Def_Scenarios							1144'58
Thames	KV	Naturalized	58'01	1'17	2'55	1'09	3'49		67'14
Thames	KV	Historic	68'02	1'12	3'11	1'19	3'29	21'43	98'58
Thames	KV	FullyLicenced	69'21	1'16	2'53	1'20	3'24	23'00	101'16
Thames	KV	Def_Scenarios							267'31
Wales	YAZ	Historic							
Wales	YAZ	RecentActual							
Wales	YAZ	Def_Scenarios							

² The runtimes for this model were only partly available because the workflow failed.

³ The run times for this model are copied from a simulation made in March 2008, before budget calculations and statistics were introduced.

9 How to dispatch a run via the manual forecast (Manual Forecast Dialog)

9.1 Introduction

An alternative way to run a task is via the Manual Forecast. This display will typically only be used by custodians when they need to import observation data or when the default scenarios data set needs to be created. It is highly recommended to dispatch scenarios via the ScenarioEditor.

The Manual forecast display can be activated through the Tools menu by selecting “execute” or by pressing **ctrl+X**.

For NGMS purposes the following items are of relevance to dispatch a run:

- Workflow selection
- Forecast description
- Scheduler options → Single forecast
- State selection → Cold state
- Run/Close buttons

All other options within this display are meant for use in real time systems and can be neglected.

Manual Forecast

Workflow
VMMV_default_scenarios [Info]

What-if scenario
None [Info]

Forecast description
defaults 1970-2006 (stats from Sept 1970)

Scheduler options

Single forecast (dd-MM-yyyy HH:mm:ss GMT)

TO: 28-08-2008 21:00:00

Scheduled forecast

Start time: 28-08-2008 21:00:00
End time: 28-08-2008 21:00:00
Interval: day [1]
Shift TO: day [0]

Approve

State selection

Select initial state

Cold state

Type: InitialCold
Run start time: 01-01-1970 00:00:00

Warm state

Search interval

Start time: 26-08-2008 21:00:00
End time: 27-08-2008 21:00:00

Priority

High
 Normal

Forecast length

Default
 User defined: day [1]

Run Close Help

9.2 Workflow selection

A workflow is a type-of run (e.g. default vs. whatif) where each workflow defines a different set of processing steps to be conducted by the model and its pre-and postprocessors. A workflow can be selected from a drop-down list with pre-configured workflows. By pressing [INFO], a description of the selected workflow can be displayed.

9.3 Forecast description

A description can be entered in this field. Entering of a description is not obligatory, but it is highly recommended as it is one of the fields which appear in the table with completed runs (Forecast Manager). A useful name could refer to the scenario and state selected..

9.4 Scheduler options & State selection

9.4.1 Background

A model run starts with an initial state. For Modflow groundwater models, the BAS-file holding the initial groundwater heads defines this initial state. Most sandstone models will have a long history before they start to reach some equilibrium status. This long history is often not held within NGMS models. Instead a BAS-file is used with initial heads where the model has 'warmed up'. Chalk models are much faster reaching an equilibrium state. Most chalk models in NGMS start from original initial starting conditions (referred to as cold state).

Within the current setting of NGMS, runs are dispatched as a single entity (i.e. not in batch mode) where the Cold State selection box is used as this selection picks a BAS file from disk to start from.

Please note that the Warm State selection box is NOT used within NGMS. This option is only relevant when running the system in real-time mode with state update runs. NGMS is not yet able to support such functionality.

Conclusion:

- Use the single Forecast Schedule option
- Use the cold state selection option

9.4.2 What to enter in the Single Forecast option box ?

The Single forecast schedule option requires T0 (dd-MM-yyy hh:mm:ss). When starting the display, the software automatically sets the calendar to current system time.

Within NGMS, T0 refers to the start date of the statistical calculations. For proper statistics, it is recommended that the model is in reasonable equilibrium (warm)

before the statistics are derived. The date itself depends on the model, while it is highly recommended to set the hour to 00:00:00

9.4.3 What to enter in the State selection box ?

Leaving Select initial state unchecked, the default state- as has been configured by the custodian - will be used to start the run. For NGMS this means that the state selection for a model will follow the state selection rules as configured in the General Adapter Module Instances.

Checking Select initial state allows the user to select a particular state to start the run. When the Select initial state checkbox is selected, as well as the Cold state radio button, one needs to specify two items:

- **Type:** Via a drop-down list a typical cold state type can be selected.
- **Run start time:** The run start time defines the length of the historic run.

For default scenarios, we basically have three initial state types available:

- **InitialCold:** the cold (chalk) or semi-cold (sandstone) state of a model
- **InitialWarm:** the warm state of a model (starting at a different date)
- **MostRecent:** the last state as available in the default model run

For each model, the actual Run start date should be defined in the dialogue. Please set the time to 00:00:00 and ensure that the run start time is earlier than T0.

9.5 Forecast length (run length)

A default forecast length is configured when setting up the system. For NGMS this is 10 years. The actual length of the run dispatched may be extended to a user defined length.

9.6 Dispatch Run

The run specification is now ready for dispatching. Press [Run] to submit the task to the Master Controller. To close the dialogue, press [Close].

9.7 Other options

For an explanation on features not used in NGMS, please check out the on-line user manual at <http://fewswiki.deltares.nl/06+Manual+Forecast+Display>.